

Hence	we	See	that (PVq) ^ 9	⇔ q	05
both	the	truth	table	values	are	⇒ g identical	TITLE
		2.39					

Truth table to prove - (p cog) () -p cog

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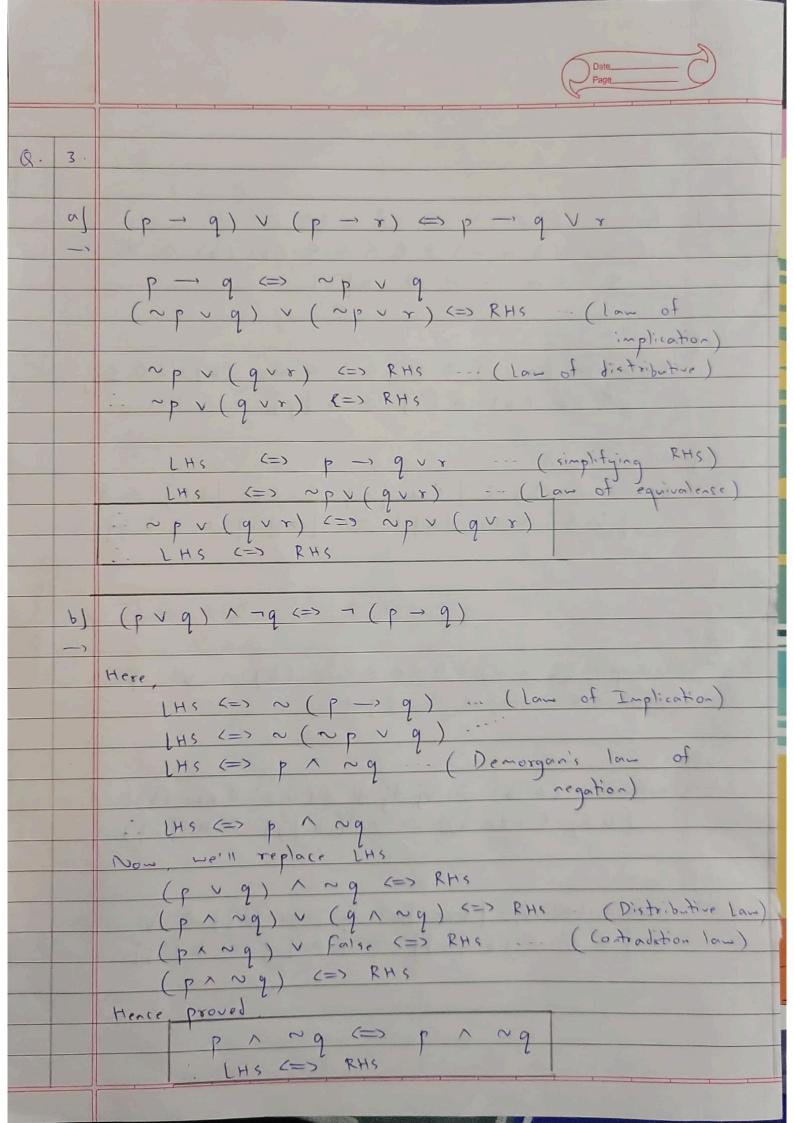
	P	9	70	P~q	¬ (p ← q)	-p ←> q	
	T	T	F	T	F	F	
	T	F	F	F	T	-	
	F	T	7	F	7	T	
- 1	F	Ł	T	τ	F	F	

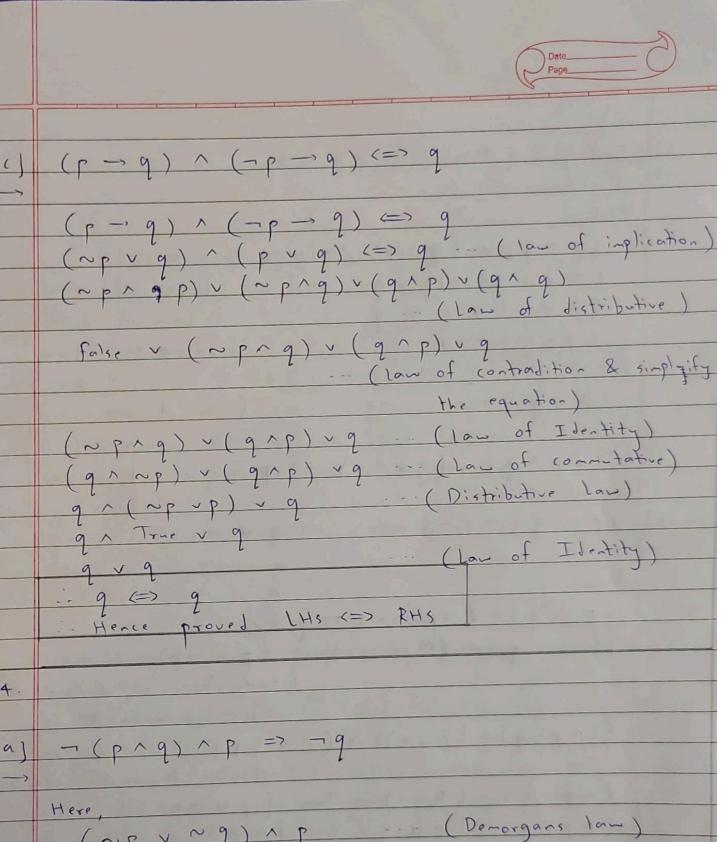
Hence 7 (p <> q) (=) -p <> q as both truth
table values are identical.

Truth table to prove TPN (pvq) -> q => T

P	9	7 p	Pvq	-p^(pvg)	7px (pvq) - q
T	T	F	7	F	T
Т	F	F	T	F	T
F	T	T	T	T	T
F	Ł	T	F	F	T

Hence, we can see that $\neg p \land (p \lor q) \rightarrow q$ is a Tautology so $\neg p \land (p \lor q) \rightarrow q \Leftrightarrow T$

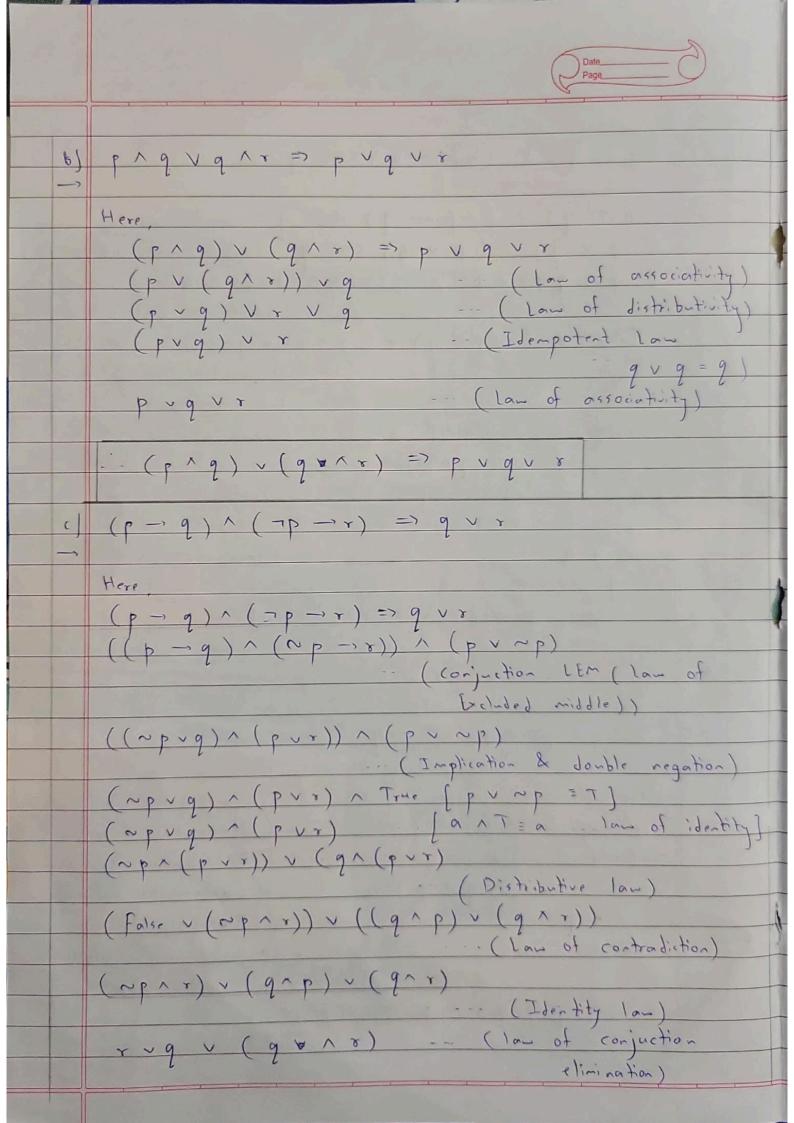


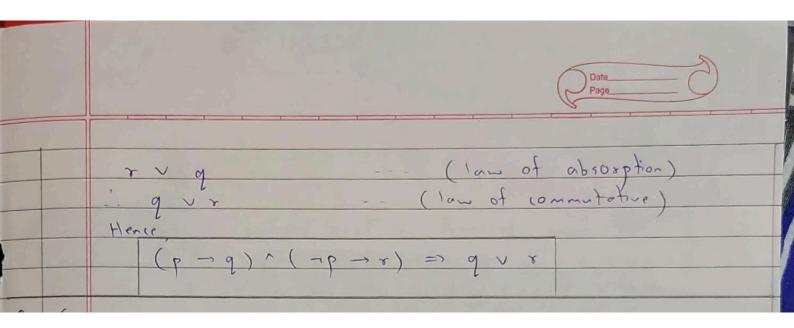


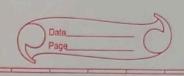
a) - (p / q) / p => - 19

... (Demorgans law) (~p v ~ 9) 1 p (mp np) v (mg np) ... (Distributive law) False V (ng np) (Contradiction law) ... (Identity law) (~q^p) - ((onjuction elimination)

Hence Topogo Ap => Tpg

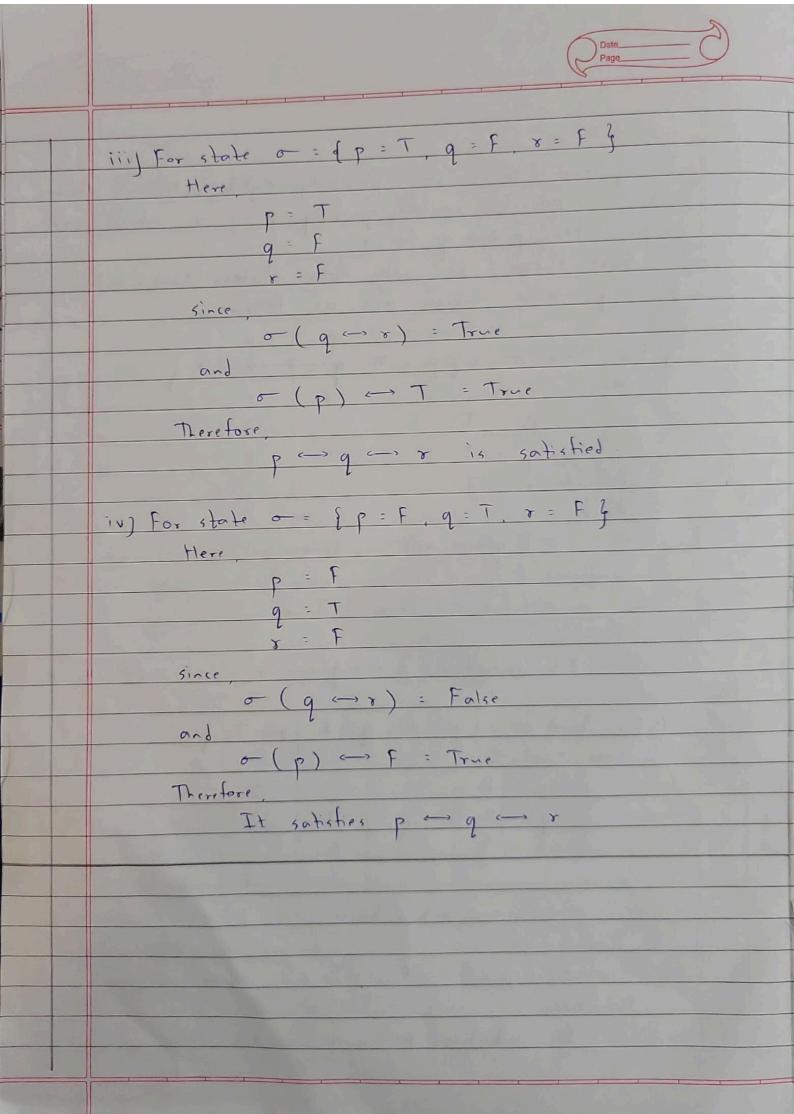






To general, there can be only eight different states that are possible containing only p, q, r which are proper for p \(\to q \cong \)

But there are only four states that satisfy p cog cor which are as follows if for state o = {p=T, q=T x=T} p : T o(q () = True o(p) <> True = True It satisfies p \(\to g \leftarrow \text{8} ii) for state o = { p = f, q = f, r = T }: p = F since, o (q (r) = false and (p) (-) f = True It satisfies p co q cor

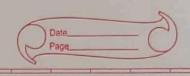


->	Truth table for p q r					
	P	9	8	9 00 7	pogos	
	T	T	T	7	T	
	7	T	F	F	F	
	T	F	T	F	F	
	T	F	F	T	7	
	F	T	T	T	F	
	F	T	F	F	7	
	t	F	T	F	7	
	F	F	F	T	F	
				Albana Sant Fine		
			The said of			

a) (b=5, i=0, x=6) is proper for predicate x > b[i] The above statement is false because b = 5 is
a single integer not an array.

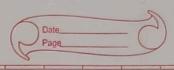
To evaluate x > b[i] b needs to be an
array. Therefore indexing b at i is not a proger .. The statement is False. b) [x=+, y=-1] is proper for expression or / sqrt (y) The above statement is True for the expression of because there would be runtime error due to square root of negative number i.e. y = -1. Thus, the statement is valid & true in terms of evaluation even though result will cause an error during the execution of expression.

The statement is True.



C] [r= 5, y= 2] = T The above statement is True because in the above expression T represents a Toutology state which is always true regardless of the state of the other different variables. -. The statement is True d) Let o = {p = T, b = (2,0,4) }, then o = p \ b[b[1]]=2 The above statement is True because P:T 6[1]=0 & b[b[1]] = b[0] :. The statement is True e I If a = b, then if x >, 0 then b[0] else a[1][3] ti is not a legal expression The above statement is True because a = b means A & b are equivalent

Here, a = b is in if clause b [0] is in then clause fa[][3] is in else clause so, if a = b i e. a & b are identical it means it has the same structure. Therefore, b[0] & [a[1][3]) are within the bounds. . The statement is True



7 A H 7 1. x2 > H => 3 H. X > 1 A x2 < H [HS: ~ Vx >, 1. x2 > xe By regating a universal quantifier it becomes existential quantifier so we get:

i. 3 x > 1 · ~ (x² > x)

i. 3 x > 1 · x² < x -- (regation of irrequality) :. 3 x x 1 / x x + x ·· ((onbining existential quantities with conjuction) : Hence proved:

7 Ax 7, 1. x2 > x (=) 3 x. x 7, 1 x x2 (x 6) 77x.7y.x7yxxxy (>> Vx. Vy.x < y V x > y LHS = NJR. Jy. H > y N K < y · Vx. Vy ~ (x>y xx < y)

(Negation of existential · Vx. Vy. x & y v x > y

- (Denorganis law & Negation of inequalities) . Hence proved 73x. 3y. x7y xx <y (=>) \x. \y. x < y \ x > y

() \(\tag{\frac{1}{2}} \cdot \text{Q(x, y)} \) \(\text{Vx. } \text{Vy. } \text{Q(y, x)} \) \(\text{Vx. } \text{Vy. } \) \(\text{Vy. } \text{Tere, } \text{Q(x, y)} \) \(\text{Vy. } \text{Q(x, y)} \) \(\text{Q(x, y)} \) \(\text{Vy. } \text{Q(x, y)} \) \(\text{Q(x, y)} Q(xe, y) is a predicate function :. LHS: ~ ((3x. 3y. g(x,y)) x bx. by. g(y,x)) ··· ~ (Jx. Jy. Q(x,y)) v ~ (Vx. Vy. Q(y,x))

··· by Demorgan's law

··· by negating the

quantifiers

··· Hence proved

··· (Jx. Jy. Q(x,y)) × Vx. Vy. Q(y,x)) &>

(Vx. Vy. ¬Q(x,y)) v Jx. Jy. ¬Q(y,x)

1 Q.	8.	
1		English and the state of the st
	aj	
	-,	is Greater (b, m, x) = 0 < m < size (b) 1 H: 0
		The transfer of the latest the la
	6)	
		has Greater (a, b) = \fi \fi \((0 \le i \le size (b)) \x
		(0 < j < size b)) - (b[j] > a [i])
	()	
1	-	Extends (a,b) = [size [a] < size [b]] A V:
1		[O < i < size[a]] -> [a[i] = b[i]]
-		
1		

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-						
9. 9.						
-						
			o-[u Hx][v HB]=	[UHA][VHB] =		
			0 [V → B][U → Z] 2.	o[NHB][UHa]?		
	uΞv	X=B		In the both Litts		
	La de	_/	are syntactically equal			
			Tes)	are updating the		
				same variable with		
	<u> </u>			sare value.		
				i. Yes		
	u=v	∝ ≠ B	Here on the RiHis.	In the above statements		
			2 = v is bind with a & L. H.S. U = V is	they will be		
			& L.H.S. UEV is	symantically different		
			bind with \$.	i. No		
			'. No			
	U = V	d=B	Here X = Bire. X &			
			B both are equal so			
			we can say the ULV	as U # V so they		
			both are binded with a	are not identical & will		
			i. Yes	have different procedures		
				.'. No		
	21 + 21	x + o	He a bolt cites in	War 22 0 22 1 22		
	ルキャ	nrp	Here, on both sides ire.	core differ to both		
			is bind with & & V			
			is binded with B.	will have different		
				procedures		
			. 10	· No		

